(b) by chromatography using SEPHACRYL S-200® [(agarose with acrylamide links)] (gel filtration media with a fractionation range of 5,000-250,000 daltons for globular proteins),

(c) by chromatography using [DEAE] diethylaminoethyl cellulose,

(d) by chromatography using CM-TRISACRYL-M® [(agarose with acrylamide links)] (gel filtration media with a fractionation range of 200-2,500 daltons), and

(e) by affinity chromatography using N-acetylneuraminic acid as a ligand.

57. (Amended The method of claim 54, comprising, after (e), treating the extract by [HPLC] high pressure liquid chromatography.

58. (Amended) The method of claim 57, wherein the [HPLC] high pressure liquid chromatography is conducted using water/acetonitrile/trifluoroacetic acid.

D26

59. (Amended) The method of claim 58, wherein 65 kd, 55 kd, and 14 kd bands are recovered if a fraction corresponding to the main peak obtained during the [HPLC] high pressure liquid chromatography is subjected to [SDS-PAGE] sodium dodecyl sulfate polyacrylamide gel electrophoresis.

REMARKS

Claims 1-11, 23, 24, 33-38, and 42-89 are pending. Claims 1-11, 23, 24, and 33-38 are withdrawn from consideration. Claims 73, 75, 77-79, 83, 85, 87, and 89 are objected as depending from a rejected claim, but are indicated as reciting allowable subject matter. Claims 42-72, 74, 76, 80-82, 84, 86, and 88 are rejected. Claims 42, 47, 60, 68, 70, 71, 80, and 81 have been cancelled, and claims 52, 43,

54, 57, and 58 have been amended. Claims 1-11, 23, 24, 33-38, 43-46, 48-59, 61-67, 69, 72-79, and 82-89 remain in the case.

Claims 42, 47, 52-60, 65, 70, 71, 80 and 81 are rejected under the second paragraph of Section 112. Claims 42, 47, 60, 70, 71, 80, and 81 have been cancelled, and claims 52, 54, 57, 58, and 59 have been amended. SEPHACRYL S-200® is now defined in the claims as "gel filtration media with a fractionation range of 5,000-250,000 daltons for globular proteins" and CM-TRISACRYL-M® as "gel filtration media with a fractionation range of 200-2,500 daltons." The new definitions are supported by the attached sheets which set forth the characteristics of these media, and provide a more informative definition for the process steps. The cancellations and amendments obviate the rejection under the second paragraph of Section 112.

Claims 42-53, 60-69, 70, 72, 74, 76, 80, 82, 84, 86 and 88 are rejected under Section 102(b) based on Zeng *et al.* The present claims all recite an isolated peptide or protein having lectinic properties and comprising the amino acid sequence of SEQ ID NO:3, 4, 5, or 6. SEQ ID NO:3 is the sequence of the sarcolectin purified by applicants, SEQ ID 5 corresponds to the 135 amino acids at the N-terminus, and SEQ IDs 5 and 6 correspond to the amino acids 4-55 and 81-95, respectively, of SEQ ID NO:3. The examiner urges that Zeng *et al.* teaches a lectin, sarcolectin, identified as a human albumin, which contains "*at least a part of an amino sequence of the recited sequence* (see the abstract and Fig. 3)" (Action at paragraph 10, emphasis added). More particularly, Zeng *et al.* disclose the identity of only 14 amino acids at the N-terminus of sarcolectin and human serum albumin (Asp-Ala-His-Lys-Ser-Glu-Val-Ala-His-Arg-Phe-Lys-Asp-Leu). ***This sequence of amino acids is not found in applicants' claimed sequences.*** Accordingly, Zeng *et al.* cannot possibly anticipate applicants' claims which recite "an isolated peptide or protein having lectinic properties and comprising the amino acid sequence of SEQ ID NO:3, 4, 5 or 6." Given the 100% identity between human serum albumin and what

Zeng identifies as "purified sarcolectin," it appears that Zeng was actually sequencing human serum albumin.

This ties in with the discussion on page 2 of applicants' specification, that all previously reported attempts to purify sarcolectin focussed on a major band in the 65 kd region protein, and the belief that the protein in this band was responsible for the biological properties associated with sarcolectin. Surprisingly, applicants have discovered that the 65 kd band corresponds to an artifact which results from the fixation of a few sarcolectin molecules on albumin. Thus, the sequence corresponding to the N-terminus of human serum albumin that is reported in Zeng, probably *is* human serum albumin that is fixed to sarcolectin molecules. Applicants have discovered, however, that the molecule that actually contains all the genetic information responsible for the sarcolectin-type properties is, in reality, found in a band at 55 kd, and it this band that has been isolated, purified and sequenced by applicants.

Claims 45, 47-50, 63 and 65-68 are rejected under 35 U.S.C. §102(b) over either of Glass and Fuchs (1985) or Glass and Fuchs (1988). The Glass and Fuchs references each disclose K7, a Type II keratin. Keratins are proteins have properties totally different from the properties of sarcolectins. Keratins are intermediate filaments in most, if not all, epithelial cells. Type II keratins are typically expressed paired with a Type I keratin. At least one member of each type is essential and sufficient for filament assembly.

Applicants' claims clearly distinguish over Glass and Fuchs, both in their sequence and their functionality. The present claims recite peptides or proteins of (1) specific sequence, that (2) have lectinic properties. As noted by the examiner, the protein disclosed in Glass and Fuchs has "98.5% identity over its entire length with SEQ ID NO:3 of the present invention, 97.0% identity with residues no. 2-135 of SEQ ID NO:4." In fact, there are 9 residues which differ between SEQ ID

NO:3 and the sequence for K7 in Glass and Fuchs -- the residues at positions 79, 83, 84, 97 155, 342, 398, 411 and 467 of SEQ ID NO: 3 differ from the residues in the Glass and Fuchs sequence, giving 98% identity, not 98.5% as alleged. By the examiner's own admission therefore, Glass and Fuchs cannot possibly anticipate those claims which recite the sequence denoted by SEQ IDs 3 and 4. Moreover, Glass and Fuchs cannot possibly anticipate SEQ ID NO:6, which corresponds to residues 81-95 of SEQ ID NO:3. Over this stretch of 15 amino acids, there are two that differ from the corresponding residues in K7, those at positions 83 and 84. This gives only 86.6% identity. Accordingly, based on sequence alone, Glass and Fuchs cannot possibly anticipate those claims which recite the sequence denoted by any of SEQ IDs 3, 4 and 6.

As to those claims which recite SEQ ID NO:5, the examiner argues that sequences comprising these 15 amino acids "would inherently have the lectinic characteristics disclosed in the specification on page 1, as the amino acid sequences are identical over the entirety of SEQ ID NO:5." It is hornbook law that there must be some reasonable certainty of inherency before a rejection under Section 102 founded on "inherency" may stand. *See, e.g., In re Brink*, 164 USPQ 247, 249 (CCPA 1970). Indeed the asserted inherency of a claimed invention must be a **necessary** result, not merely a possible result, arising from the prior art. *Ex parte Keith*, 154 USPQ 320,321 (PTO Bd.Pat.App. 1966). *See also Kropa v. Robie*, 88 USPQ 478, 483 (CCPA 1951) ("Inherency does not mean that thing might happen one out of twenty times...It must inevitably happen for the doctrine [of inherency] to apply.") Given the teaching in Glass and Fuchs that the molecules disclosed therein are keratins, proteins that function to form structural filaments in epithelial cells, there is no reasonable basis for an assertion that any protein disclosed in Glass and Fuchs meets applicants' recitation of a protein comprising a specified sequence and "having lectinic properties."

Applicant respectfully submits that all of the pending claims are now in condition for allowance. An early notice to this effect is earnestly solicited. If there are any questions regarding the application, the examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,

28 February 2001
Date

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 19-0741 for any such fees; and applicant(s) hereby petition for any needed extension of time.